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Timothy J Oyer
Wolf Greenfield & Sacks
Federal Reserve Plaza
600 Atlantic Avenue
Boston, MA 02210-2211

EXAMINER	
CHANG, VICTOR S	
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Please find below and/or attached an Office communication concerning this application or proceeding.

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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/720,710
Filing Date: June 01, 2001
Appellant(s): CHAN ET AL.

Michael J. Pomianek
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 12/29/2008 appealing from the Office action mailed 8/30/2007.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

J. Lee et al., "Polymerization of monomers containing functional silyl groups. 7. Porous membranes with controlled microstructures, vol. 22, no. 6, pp. 2602-2606, 1989

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

I. Claims 1, 17 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. [Macromoelcules, 22, pp. 2602-2606].

Lee teaches a porous membrane prepared from a film of block copolymer. The copolymer is synthesized by anionic polymerization of poly(4-vinylphenyl)dimethyl-2-propoxysilane and poly(isoprene). Depending on architecture of the block copolymer and casting conditions, periodic microstructures of the porous membrane can be formed by controlled morphology of the segregated domains of the block copolymer. After crosslinking, the poly(4-vinylphenyl)dimethyl-2-propoxysilane domain, the poly(isoprene) block is decomposed to form a continuous hollow domain through the membrane. The TEM and SEM observations of the block copolymer and the resulting porous membrane revealed that the structure of the original block copolymer film directly reflected in the shape and size of the micropores. The microstructure of the porous membrane can be controlled chiefly by the morphology of the segregated microphase depending on architecture of block copolymer and casting conditions of the film. Narrow molecular weight distributions of the block lengths of the copolymer provide uniform micropores. Furthermore, the SEM of the cross-section of the membrane shows a continuous structure of micropores through the membrane (a three-dimensional structure) [pp. 2602]. With sufficient polyisoprene block length (molecular weight), block copolymers I and II forms microporous membranes with a three-dimensionally periodic structure and their hollow domains are topologically continuous throughout the membrane structure. Fig. 3 illustrates micrographs of surfaces and cross-sections of the block copolymer films I and II, and Table V lists the periodicities of the structures of the microporous membrane [pp. 2606].

For claims 1 and 17, since Lee teaches a membrane it is calculated that the atomic% of silicon atom in the terminal blocks of poly(4-vinylphenyl)dimethyl-2-propoxysilane is 1/35 = 2.86 atomic%, i.e., it is about 3 atomic% as claimed. Regarding the limitation "an inorganic species capable of forming a ceramic oxide", since the claimed limitation is optional, there is no requirement for the prior art to provide or account for the limitation, i.e., it does not constitute a limitation in any patentable sense.

For claim 23, Lee discloses that glass transition temperature of the terminal silicon containing block is about 465°K (193°C), which is greater than 0°C (pp. 2603).

II. Claim 24 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lee et al. [Macromoelcules, 22, pp. 2602-2606].

The teachings of Lee are again relied upon as set forth above.

For claim 24, Lee discloses that the terminal silicon containing block has average degree of polymerization of 100 (pp. 2602-2603), or average molecular weight of 22,000, i.e., about 30,000. Alternatively, since Lee discloses the same subject matter for the same use (a porous membrane having periodic microstructures) as the claimed invention, and teaches that depending on the architecture of the block copolymer, the shape and size micropores can be designed, a workable average molecular weight of the silicon containing block is deemed to be either anticipated by Lee, or an obvious routine optimization to one of ordinary skill in the art, motivated by the desire to obtain designed micropore sizes required by end applications.

(10) Response to Argument

Appellants argue at page 9

> "The Lee reference by contrast discloses porous membranes which do not include both a three-dimensionally periodic structure and at least two topologically continuous domains.

> Rather, the Lee reference discloses only porous membranes prepared from block copolymers having *one-dimensionally* periodic structures of lamellar domains or having *two-dimensionally* periodic structures of cylindrical domains or having three-dimensionally periodic structures of spherical domains, which are *not topologically continuous*."

However, appellants admit that Lee teaches various periodic structures, including the three-dimensionally periodic structures of spherical domains, which is commensurate with Lee's teaching of the periodicities of the microporous membrane in Table V. Regarding the term "topologically continuous", since Lee teaches that 1) the poly(4-vinylphenyl)dimethyl-2-propoxysilane domain, the poly(isoprene) block is decomposed to form a continuous hollow domain through the membrane, 2) the SEM of the cross-section of the membrane shows the continuous structure of micropores through the membrane, and 3) the membrane has periodic microporous structure, the examiner asserts that Lee teaches the structural features as claimed. Appellants' argument to the contrary is unpersuasive.

Appellants' arguments at pages 9-10 relating membranes having other structural features not relied upon are misplaced. Appellants are reminded that Lee merely shows in these examples how the length of the block copolymers affects the porous structures of the resulting membrane, and how the microporous structures can be controlled and designed. Nothing whatsoever has Lee limited its membrane to any particular structure.

Appellants speculate at pages 11-12

> "the spherical domains described in Lee are "discrete" domains that are physically isolated from, and not in physical contact with, other like domains in the structure (e.g., page 14, lines 8-10 of Applicant's specification) and do not form a continuous pathway through the structure."

However, absence of any evidentiary support, appellants argument in vacuum that Lee's membrane necessary has physically isolated "discrete" domains ignores Lee's express teaching

that 1) the poly(4-vinylphenyl)dimethyl-2-propoxysilane domain, the poly(isoprene) block is decomposed to form a continuous hollow domain through the membrane, 2) the SEM of the cross-section of the membrane shows the continuous structure of micropores through the membrane, and 3) the membrane has periodic microporous structure.

Appellants argue at page 12

> "the Examiner has not provided a reason as to why one of ordinary skill in the art would modify Lee to predictably produce the invention as claimed, or how one skilled in the art would combine known elements, or substitute one known element for another, to predictably arrive at the invention as claimed."

However, Lee discloses that the terminal silicon containing block has average degree of polymerization of 100 (pp. 2602-2603), or average molecular weight of 22,000, i.e., about 30,000. Alternatively, since Lee discloses the same subject matter for the same use (a porous membrane having periodic microstructures) as the claimed invention, and teaches that depending on the architecture of the block copolymer, the shape and size micropores can be designed, a workable average molecular weight of the silicon containing block is deemed to be either anticipated by Lee, or an obvious routine optimization to one of ordinary skill in the art, motivated by the desire to obtain designed micropore sizes required by end applications.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Victor S Chang/

Primary Examiner, Art Unit 1794

Conferees:

/Jennifer Michener/

QAS, TC1700

/Rena L. Dye/
Supervisory Patent Examiner, Art Unit 1794